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Cryptotis goodwini.

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Cryptotis Pomel, 1848

Cryptotis Pomel, 1848:249. Type species "*M[usaraneus]. cinereus* (sorex [sic] *cinereus* Bachm)" [= *Sorex parvus* Say], by original designation.

Soriciscus Coues, 1877:649. Type species "*Sorex parvus* Say or *S. cinereus* Bachm," by original designation.

Xenosorex Schaldach, 1966:289. Type species *Notiosorex* (*Xenosorex*) *phillipsii* Schaldach [= *Blarina mexicana peregrina* Merriam], by original designation.

CONTEXT AND CONTENT. Order Insectivora, Family Soricidae, Subfamily Soricinae, Tribe Blarinini (see Repenning, 1967). The genus *Cryptotis* includes 12 nominal Recent species, as follows (key adapted from Choate, 1970:223–224):

1 Occurring in North and Middle America 2
Occurring in South America 9

2(1) Tail elongate, more than 45 per cent of length of head and body; rostrum markedly elongate relative to remainder of skull 3
Tail not elongate, less than 45 per cent of length of head and body; rostrum not markedly elongate relative to remainder of skull 5

3(2) Dentition bulbous; posterior surfaces of P4 through M2 (teeth labelled in figure 1) usually not recessed; rostrum broad 4
Dentition not bulbous; posterior surfaces usually slightly recessed; rostrum slender ..... *C. gracilis*

4(3) Size large (total length 123 to 135 mm; condylobasal length, a in figure 1, 22.5 to 23.7); occurring only in southern Mexico ..... *C. magna*
Size medium (total length 109; condylobasal length 20.4); occurring only in southern Central America ..... *C. endersi*

5(2) Dentition bulbous ..... *C. nigrescens*
Dentition not bulbous 6

6(5) Forefeet conspicuously large; claws distinctly long and broad 7
Forefeet small; claws short and slender 8

7(6) Size large (total length 103 to 128 mm; condylobasal length 20.4 to 21.9; cranial breadth, b in figure 1, 10.6 to 11.8); talonid of m3 (arrow near bottom of figure 1) reduced, consisting only of hypoconid, and shortened antero-posteriorly; winter pelage almost black; upper surfaces of feet usually black ..... *C. goodwini*
Size medium to large (total length in region of potential sympatry with *goodwini* 101 to 111; condylobasal length 19.3 to 20.5; cranial breadth 10.1 to 10.8); talonid of m3 only moderately reduced, usually consisting only of hypoconid but vestigial entoconid sometimes present, and not shortened antero-posteriorly; winter pelage dark brown, usually with slight olive cast; upper surfaces of feet usually pale ..... *C. goldmani*

8(6) Size medium (total length 83 to 112; condylobasal length 17.5 to 20.2); talonid of m3 almost always consisting of both hypoconid and well developed entoconid; posterior surfaces of P4 through M2 only slightly if at all recessed; color of venter dark, only slightly paler than dorsum ..... *C. mexicana*
Size small (total length in region of sympatry with *mexicana* 69 to 99; condylobasal length 15.3 to 18.4); talonid of m3 consisting only of hypoconid; posterior surfaces of P4 through M2 moderately to considerably recessed; color of venter whitish, considerably paler than dorsum ..... *C. parva*

9(1) Venter (pale buff to buff) markedly paler than dorsum (grayish brown) ..... *C. thomasi*
Venter only slightly, if at all, paler than dorsum 10

10(9) Pelage pale gray both above and below ..... *C. montivaga*
Pelage dark brown or black both above and below 11

11(10) Size large (palatal length, c in figure 1, 9.2 to 10.0; maxillary breadth, d in figure 1, 6.6 to 7.2) ..... *C. squamipes*
Size small (palatal length 8.3 to 8.6; maxillary breadth 6.3 to 6.4) ..... *C. avia*

Cryptotis goodwini Jackson, 1933
Goodwin's Shrew

Cryptotis goodwini Jackson, 1933:81. Type locality "Calel, altitude 10200 feet, Guatemala."

CONTEXT AND CONTENT. Context is given above in the generic account. *Cryptotis goodwini* is a monotypic species (Choate, 1970).

DIAGNOSIS. The size is large for the genus; tail is short, averaging 35 per cent of length of head and body; forefeet and claws are large; rostrum is relatively long and slender; braincase is not especially angular; anterior limit of zygomatic plate is above metastyle of M1; posterior limit of zygomatic plate is at level of, or posterior to, maxillary process, above M3

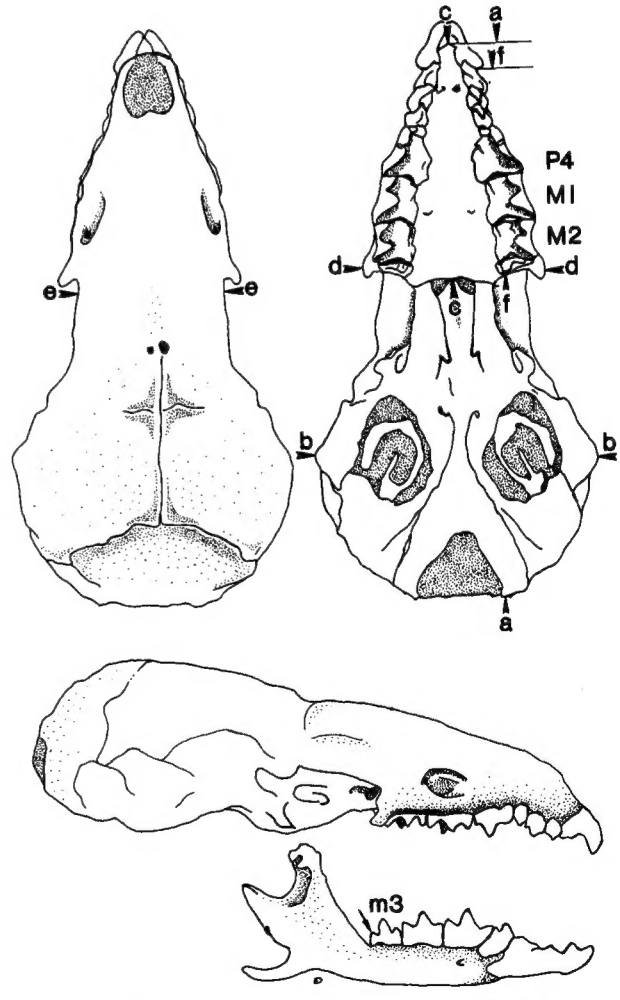

FIGURE 1. Dorsal, ventral, and lateral views of skull, and lateral view of lower jaw of *Cryptotis goodwini* (USNM 77072, male, from Calel, Guatemala). Labelled dimensions and teeth are noted in the key and text.

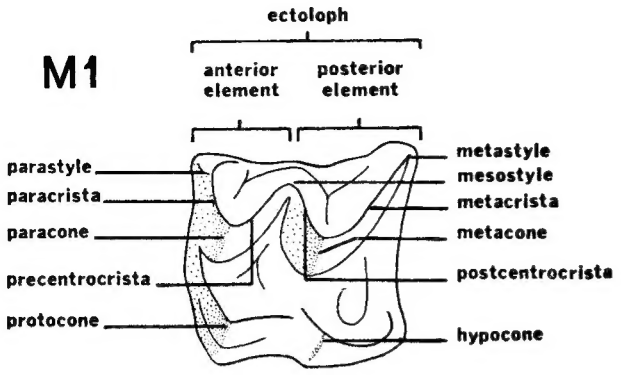

FIGURE 2. First left upper molar of a *Cryptotis* to show dental terminology (Choate, 1970:210).

(figure 1); dentition is not bulbous; anterior element of ectoloph of M1 is reduced relative to posterior element; posterior surfaces of P4 through M2 are decidedly recessed; protoconal basin of M1 is reduced relative to hypoconal basin; M3 consists primarily of paracrista, precentrocrista is usually vestigial and frequently absent; talonid of m3 is reduced, short, consisting only of hypoconid, which frequently is vestigial (Choate, 1970:249–250; dental terminology illustrated in figure 2). Choate (1969:471–474 and 1970:211) illustrated additional details of the skull and dentition.

GENERAL CHARACTERS. Total length is 103 to 128 mm; length of hind foot is 14 to 17; condylobasal length (a in figure 1) is 20.4 to 21.9; palatal length (c) is 8.5 to 9.4; maxillary breadth (d) is 6.5 to 7.3; interorbital breadth (e) is 5.4 to 6.0; length of maxillary toothrow (f) is 7.0 to 8.4; and cranial breadth (b) is 10.6 to 11.8. Adult summer and winter pelages are distinctive (winter pelage is luxuriant and numerous vermiculations are present, whereas summer pelage is not especially luxuriant and vermiculations are present only when the pelage is fresh). In winter pelage, the dorsum is near Bister (capitalized color terms after Ridgway, 1912) in old specimens (collected in 1896) but nearer Clove Brown in recently taken specimens (1954 and 1955); the venter is paler than the dorsum because of admixture of pale buff- or white-tipped hairs. In summer pelage the dorsum is near Bister in specimens obtained in 1926, nearer Clove Brown in specimens collected in 1947; the venter is only slightly paler.

DISTRIBUTION. The species is known only from the highlands of southern Guatemala and western El Salvador, but possibly also occurs on the Sierra Madre of Chiapas and the highlands of western Honduras. Localities from which specimens have been obtained are plotted in figure 3 and listed below from north to south. GUATEMALA: 3½ mi. SW San Juan Ixcoy, 3085 m (Genoways and Choate, 1967:204); Finca Xicacao, *ca* 915 m; Hacienda Chancol, 15 mi. W Nebaj, 2900 to 3350 m (Choate, 1970:251); 5 mi. N, 1 mi. W Santa Cruz El Chol, 1830 m (Genoways and Choate, 1967:204); S Slope Volcán Tajamulco, 3050 m (Choate, 1970:251); Calel, 3110 m (Jackson, 1933:81); Finca La Paz, *ca* 1220 m (Choate, 1970:251); Cumbre María Tucum, *ca* 3020 m (Musser, 1964:7); Santa Elena, 3020 to 3050 m (Choate, 1970:251); Volcán Santa María, 2740 to 3350 m (Choate, 1970:251); Tecpán, 2960 m (Goodwin, 1934:6); Mataquescuintla, 2560 m (Choate, 1970: 251). EL SALVADOR: Hacienda Montecristo, Santa Ana (Felten, 1958:218).

No fossils of this species as yet have been found.

FORM AND FUNCTION. *Cryptotis goodwini* is the most highly specialized member of the *mexicana* species group (including *C. mexicana*, *C. goldmani*, and *C. goodwini*). Together with *C. goldmani*, *C. goodwini* has large forefeet and claws, probably indicative of semifossorial habits. In addition, *goodwini* exhibits more extreme reduction of dentition than any other Middle American representative of the genus *Cryptotis*. The talonid of the lower third molar in *goodwini* never consists of more than one cusp, and that cusp (the hypoconid) is vestigial in many specimens. The third upper molar generally has become reduced to a single bladelike crest (the paracrista). Emargination of the upper molariform teeth is more pronounced than in either *C. mexicana* or *C. goldmani*, and approaches the most extreme condition found in Mexican populations of *C. parva* (Choate, 1970:250).

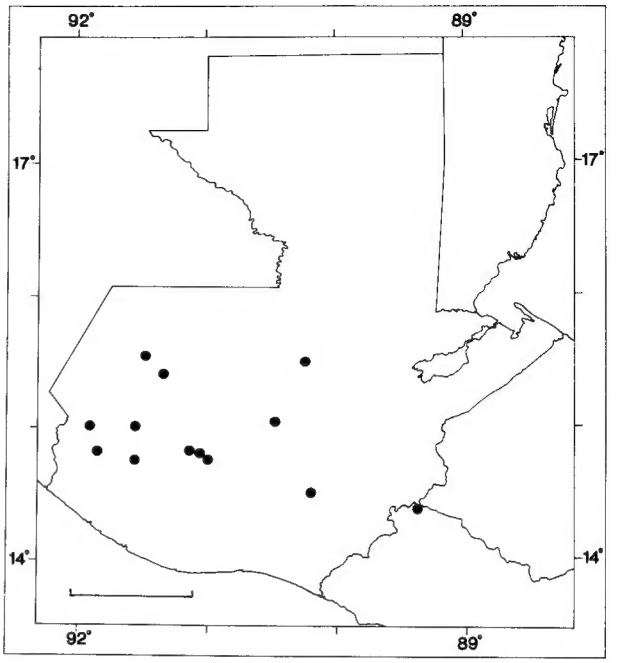

FIGURE 3. Map of Guatemala and adjacent regions of surrounding countries showing known geographic distribution of *Cryptotis goodwini* (see text for list of localities). Scale at lower left represents 100 km.

Most specimens collected in December and January are in adult winter pelage, but one (USNM 77075) was molting over its entire body and another (KU 64611) was molting spottily. One specimen (UMMZ 99541) obtained in May has obviously worn adult winter pelage. Of a series of eight specimens collected in August, six are in badly worn adult summer pelage, one (UMMZ 112007) was molting over the head, and one (UMMZ 112010) was molting over the head, on the venter, and on the back in the form of a saddle.

ECOLOGY. *Cryptotis goodwini* is thought to occur primarily in humid montane forests. Elevations on major topographic features from which representatives of the species have been obtained include the following: 2900 to 3350 m on the Alto Cuchumatanes; approximately 915 m on the Sierra de Xucaneb; 1830 to 3050 m on the Sierra de Chuacús; and approximately 1220 to 3350 m on the Sierra Madre de Guatemala. Most specimens have been obtained in forests of pine or oak, frequently containing cypress, fir, or alder, and often interspersed with sacatón or mosses. These elevations and habitats correspond to the Canadian and Humid Upper Tropical life zones of Goldman (1951), and are included within the subtropical life belt of Stuart (1950) and the subtropical and temperate life belts of Griscom (1932). *Cryptotis goodwini* is too poorly known ecologically to warrant more than a general account of its distribution, but it is noteworthy from the standpoint of ecological distribution that the species exhibits no apparent variation among populations inhabiting the different highland masses of southern Guatemala (Choate, 1970:250–251).

With regard to predation, Goodwin (1934:6) reported that a shrew of this species "was found in the trail in the forest above Tecpam [sic], where some animal had killed and dropped it,—a not unusual custom among the small carnivores. I recall one, and perhaps two others, found under similar conditions, near the heavy forest of cypress, at a point a few miles northwest of Tecpam [sic] and at about 10,000 feet altitude. It was impossible to save these."

REMARKS. No representatives of this species have been caught alive, and all specimens presently available in collections consist only of skins with skulls. Therefore, little is known of form excepting that of pelage, cranium, and dentition. Likewise, no published information as yet is available regarding physiology or other dynamic aspects of function, population structure, genetics, or behavior.

ETYMOLOGY. The specific name *goodwini* was proposed in honor of "George G. Goodwin of the American Museum of Natural History, in recognition of his interest in Guatemalan mammals and who suspected the present form as new on the basis of a single imperfect specimen from Tecpam [sic], Guatemala, in the collection of the American Museum" (Jackson, 1933:81).

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